ST268

CLE266 Embedded Board

USER'S MANUAL

Version 1.1

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Table of Contents

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Introduction

Product Description

ST268 is a high-performance flexible embedded board based on the VIA CLE 266 chipset. The chipset is based on an innovative and scaleable architecture with proven reliability. It is a two-chip set consisting of the VT8623 North Bridge Controller and VT8235 South Bridge Controller.

ST268 supports the Socket 370 processors with speeds of up to 1.4GHz and with front side bus of up to 133MHz. Two 184-pin DDR DIMM sockets supports can accommodate a total memory size of 1GB.

Combining a fully integrated video processing feature set, Integrated UniChrome™ 2D/3D graphics engine and ultra efficient VIA DDR memory controller, the VIA Unichrome™ CLE266 Chipset is designed to enable high quality digital video streaming and DVD playback in a new generation of small form factor PCs and IA devices

One 10/100mbps Ethernet is supported by the Realtek 8100C single chip Ethernet controller. With a secondary LPC I/O chip, the board supports six RS232 COM ports.

With dimensions of 270mm by 160mm, ST268 has other features and connectors such CF card socket, two IDE channels, and four USB .1/2.0 compliant ports.

Specifications

Product Name	ST268
CPU Type	Socket 370 (Intel PIII / Celeron)
CPU Voltage	1.1V~1.8+5V
System Speed	533MHz~1.4GHz
CPU External Clock	66/100/133Mhz
Green / APM	APM1.2
CPU Socket	Socket 370
Chipset	VIA CLE266 North Bridge: 548 pin BGAVT8623 (2D/3D) South Bridge: 487 pin VT8235
BIOS	Award BIOS, 2Mbit, supports ACPI function
Cache	CPU integrated
Memory	Two 184-pin DDR DIMM socket, DDR200/266 DIMM modules, Max.1GB
VGA	VT8623 integrated AGP 4X VGA controller
LCD Interface	Support 18 bit LVDS panel (DF13-20)
LAN	Realtek RTL8100C (10/100Mb) single chip Ethernet controller.
Sound	AC97
LPC I/O	Winbond 83697HF: Parallel x1, COM1, COM2, FDC 1.44MB (slim type), hardware monitor (3 thermal inputs, 8 voltage monitor inputs
Secondary LPC I/O	Fintek F81216D COM3, 4, 5, 6 (RS232)
Uart/16550A(6 ports)	COM1, 2, 3, 4, 5, 6: RS232
RTC/CMOS	Built in VT8235
Battery	Lithium Battery
Keyboard/Mouse	Built in VT8235
Parallel IDE (44 pin)	Built in VT8235, IDE1, IDE2 (UDMA 33/66/100/133)
CF card connector	One port (share IDE2 slave)
USB	4 ports, USB 1.1/2.0, (D-Sub x2, Pin header x2)
Operating Temperature	0°C ~ 60°C (32°F ~140°F)
Storage Temperature	-20°C ~ 80°C (68°F ~176°F)
Relative Humidity	10% ~ 90% (non-condensing)
Dimensions	270mm x 160mm

Board Dimensions
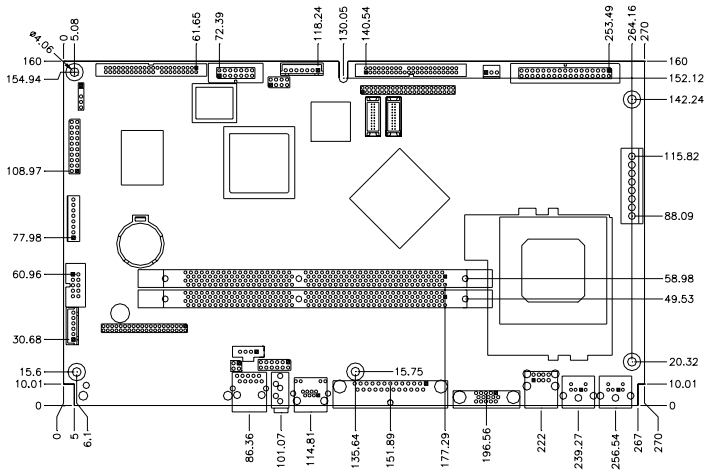
Installations

This section provides information on how to use the jumpers and connectors on the ST268 in order to set up a workable system. The topics covered are:

Installing the Memory (DDR DIMM)

The ST268 board supports two 184-pin DDR DIMM socket for a maximum total memory of 1GB in DDR DRAM type. The memory module capacities supported are 64MB, 128MB, 256MB, and 512MB.

Installing and Removing DIMMs

To install the DDR DIMM, locate the memory slot on the board and perform the following steps:

1. Hold the DIMM so that the two keys of the DIMM align with those on the memory slot.

2. Gently push the DIMM in an upright position until the clips of the slot close to hold the DIMM in place when the DIMM touches the bottom of the slot.

3. To remove the DDR module, press the clips with both hands.
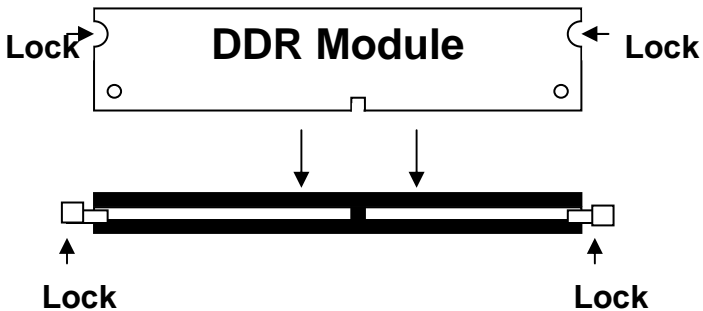
Top View of DIMM Socket

Setting the Jumpers

Jumpers are used on ST268 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on ST268 and their respective functions.

Jumper Locations on ST268

JP2: CF Card Master / Slave Selection

JP2	Setting	Master / Slave
□ □	Short/Closed	Master
□ □	Open	Slave

JP3: FDD Pin 1/3/5 Power Selection

JP3	Setting	Voltage
□ □ □ 1 2 3	Pin 1-2 Short/Closed	+5V
□ □ □ 1 2 3	Pin 2-3 Short/Closed	GND (Default)
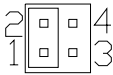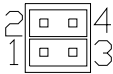
JP4: LCD Power Selection

JP4	Setting	Function
□ □ □ 1 2 3	Pin 1-2 Short/Closed	3.3V (Default)
□ □ □ 1 2 3	Pin 2-3 Short/Closed	+5V

JP5: Clear CMOS Content

JP5	Setting	Function
□ □ □ 1 2 3	Pin 1-2 Short/Closed	Normal Operation
□ □ □ 1 2 3	Pin 2-3 Short/Closed	Clear CMOS Content

JP7: VFD's DSR / CTS Selection

JP7	Setting	Function
2 □ □ 4 1 □ □ 3	Pin 1-2 Short/Closed	No VFD
2 □ □ 4 1 □ □ 3	Pin 1-3, 2-4 Short/Closed	VFD Enable

Connectors on ST268

The connectors on ST268 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on ST268 and their respective functions.

Connector Locations on ST268

P1: Power Connector

Signal Name	Pin #	Pin #	Signal Name
+5V	1	5	GND
+5V	2	6	+12V
GND	3	7	+5VSB
GND	4	8	PS_ON

CN1: CompactFlash Socket

J1: LCD Inverter Connector

Pin #	Signal Name
1	ENVEE
2	GND`
3	+12V

J3: LCD TTL Output Connector (22x2 pin)
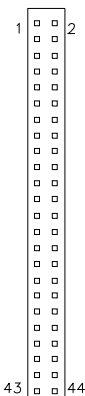
Signal Name	Pin #	Pin #	Signal Name
+12V	1	2	+12V
GND	3	4	GND
+5V/3.3V	5	6	+5V/3.3V
ENAVEE	7	8	GND
P0	9	10	P1
P2	11	12	P3
P4	13	14	P5
P6	15	16	P7
P8	17	18	P9
P10	19	20	P11
P12	21	22	P13
P14	23	24	P15
P16	25	26	P17
P18	27	28	P19
P20	29	30	P21
P22	31	32	P23
GND	33	34	GND
SHFCLK	35	36	FLM
MDE	37	38	LP
GND	39	40	ENABKL
GND	41	42	NC
DNAVDD	43	44	+5V/3.3V

J5: System Function Connector

Pin #	Signal Name
1	+5VSB
2	GND
3	+5V
4	PW_BUTTON
5	GND
6	+5V PULL HIGH
7	IDE LED
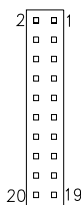
J6: Touch Screen Connector
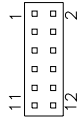
Signal Name	Pin #	Pin #	Signal Name
DCD2	1	2	DSR2
RXD2	3	4	RTS2
TXD2	5	6	CTS2
DTR2	7	8	+5V
GND	9	10	NC
GND	11	12	GND
NC	13	14	NC

J7: Floppy Drive Connector
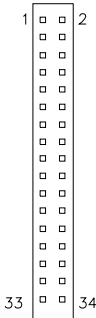
Signal Name	Pin #	Pin #	Signal Name
+5V/GND	1	2	RM/LC
+5V/GND	3	4	NC
+5V/GND	5	6	NC
GND	7	8	Index
GND	9	10	Motor enable 0
GND	11	12	Drive select 1
GND	13	14	Drive select 0
GND	15	16	Motor enable 1
GND	17	18	Direction
GND	19	20	Step
GND	21	22	Write data
GND	23	24	Write gate
GND	25	26	Track 00
GND	27	28	Write protect
GND	29	30	Read data
GND	31	32	Side 1 select
GND	33	34	Diskette change

J9, J8: 1st and 2nd Channel LVDS Connector (DF13-20)

Signal Name	Pin #	Pin #	Signal Name
TX0-	2	1	TX0+
GND	4	3	GND
TX1-	6	5	TX1+
+5V/3.3V	8	7	GND
TX3-	10	9	TX3+
TX2-	12	11	TX2+
GND	14	13	GND
TXC-	16	15	TXC+
+5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

J11: System Fan Power Connector

J11 is a 3-pin header for the system fan. The fan must be a 12V fan.

Pin #	Signal Name
1	GND
2	+12V
3	Rotation detection

J12: CPU Fan Power Connector

J12 is a 3-pin header for the CPU fan power.

Pin #	Signal Name
1	GND
2	+12V
3	Rotation detection

J13: Con IR Connector
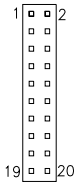
Signal Name	Pin #	Pin #	Signal Name
+5VSB	1	2	+5VSB
NC	3	4	KB_CLK1
NC	5	6	NC
NC	7	8	KB_DATA1
GND	9	10	GND
GND	11	12	GND
MSDAT-	13	14	MSDAT#
NC	15	16	NC
MSCLK-	17	18	MSCLK#
NC	19	20	NC

1 ▢ ▢ 2
19 ▢ ▢ 20
*Default
13-14
17-18
Short

J14,J2: Primary and Secondary IDE Connector
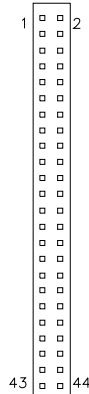
Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	GND
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
GND	19	20	Protect pin
DRQ0	21	22	GND
Host IOW	23	24	GND
Host IOR	25	26	GND
IOCHRDY	27	28	Host ALE
DACK0	29	30	GND
IRQ14	31	32	NC
Address 1	33	34	NC
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	GND
+5V	41	42	+5V
GND	43	44	NC

1 ▢ ▢ 2
43 ▢ ▢ 44

J15: CON 8/F (Card Reader)

Pin	Signal Name
1	KB_CLK2
2	KBCLK#
3	KB-DATA2
4	KBDAT#
5	GND
6	GND
7	+5V
8	+5V

J17: COM3/4/5/6 Serial Ports

J17 is a 40-pin connector for the COM3/4/5/6 serial ports on ST268.
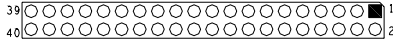
Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10,20	+12V
30,40	+5V

J18: Scanner Device Connector

Signal Name	Pin #	Pin #	Signal Name
+5V	1	2	GND
RXD1	3	4	TXD1
RTS1	5	6	CTS1
KB_DATA2	7	8	KBDAT-
KB_CLK2	9	10	KBCLK-

J19: CON 6/F VFD Connector
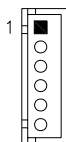
Pin	Signal Name
1	+12V
2	GND
3	VDSR
4	DSR1
5	TXD1
6	VTXD

J20: Audio Connector

J20, a 12-pin header connector, supports an optional external connector supporting 3 sockets for Line Out, Line In and Mic functions. The following table shows the pin assignments of this connector.
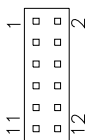
Signal Name	Pin #	Pin #	Signal Name
Line Out R	1	2	Line Out L
GND	3	4	GND
Line In R	5	6	Line In R
GND	7	8	GND
Mic	9	10	BIAS
GND	11	12	NC

J21: CD-in Connector

J21 is the 4-pin CD-in connector.
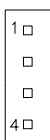
Pin #	Signal Name
1	Right
2	GND
3	GND
4	Left

J22: PS/2 Keyboard Connector
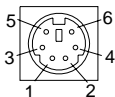
Pin	Signal Name
1	Keyboard data
2	KB_Data1
3	GND
4	+5V
5	Keyboard clock
6	KB_Clk1

J23: PS/2 Mouse Connector
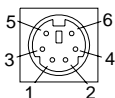
Pin	Signal Name
1	Mouse data
2	NC
3	GND
4	+5V
5	Mouse clock
6	NC

J24: COM1 Serial Port

The COM1 serial port uses a typical RJ45 connector as its interface connector.

Signal Name	Pin #	Pin #	Signal Name
DCD1	6	1	VDSR
DTR1	7	2	GND
VCTS	8	3	GND
RTS1	9	4	VTXD
RI1	10	5	RXD1

J25: Line Out Connector

The line out connector comes in a phone jack type connector.

J26: Primary Parallel Port Connector

The following table describes the pin-out assignments of this connector.
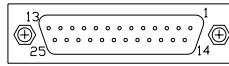
Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	GND
PD4, parallel data 4	6	19	GND
PD5, parallel data 5	7	20	GND
PD6, parallel data 6	8	21	GND
PD7, parallel data 7	9	22	GND
ACK, acknowledge	10	23	GND
Busy	11	24	GND
Paper empty	12	25	GND
Select	13		

J27: RJ45 Connector for LAN

VGA1: VGA CRT Connector
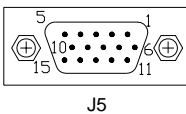
J5

Signal Name	Pin	Pin	Signal Name
Red	1	2	Green
Blue	3	4	NC
GND	5	6	GND
GND	7	8	GND
NC	9	10	GND
NC	11	12	NC
HSYNC	13	14	VSYNC
NC	15		

USB1: USB Connector
USB1 consists of a two stacked USB ports. Refer to the section below for the respective pin assignments.
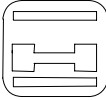
Pin #	Signal Name
1	+5VSB
2	USB-
3	USB+
4	GND

JX1: USB3/4 Connector
JX1 is the onboard USB pin-header that supports an external USB connector with two ports.

Pin #		Signal Name
1	5	+5VSB
2	6	USB-
3	7	USB+
4	8	GND

BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports VIA C3 processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press <DEL> to Enter Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Phoenix - AwardBIOS CMOS Setup Utility

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type…	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section which displays information on the currently highlighted item in the list.

Note: *If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the board is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Tue, Mar 26 2000	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level
IDE Primary Master		Change the day, month,
IDE Primary Slave		Year and century
IDE Secondary Master		
IDE Secondary Slave		
Drive A	None	
Drive B	None	
Video	EGA/VGA	
Halt On	All, But Keyboard	
Base Memory	640K	
Extended Memory	129024K	
Total Memory	130048K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day :	**Sun to Sat**
Month :	**1 to 12**
Date :	**1 to 31**
Year :	**1994 to 2079**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour :   00 to 23**
                     Minute :   00 to 59
                     Second :   00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Primary HDDs / IDE Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

   CYLS :   Number of cylinders
   HEAD :   Number of read/write heads
   PRECOMP :   Write precompensation
   LANDZ :   Landing zone
   SECTOR :   Number of sectors

The Access Mode selections are as follows:

                        Auto
                Normal (HD < 528MB)
                Large   (for MS-DOS only)
                LBA   (HD > 528MB and supports
                        Logical Block Addressing)

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

         360KB   1.2MB   720KB   1.44MB 2.88MB
         5.25 in. 5.25 in. 3.5 in. 3.5 in. 3.5 in.

Video

This field selects the type of video display card installed in your system.
You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is
detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a key-board or disk error; it will stop for all others.

Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

Virus Warning	**Disabled**	ITEM HELP
CPU Internal Cache	Enabled	Menu Level
External Cache	Enabled	
CPU L2 Cache ECC Checking	Enabled	Allows you choose
Processor Number Feature	Enabled	the VIRUS warning
Quick Power On Self Test	Enabled	feature for IDE Hard
First Boot Device	HDD-0	Disk boot sector
Second Boot Device	HDD-0	protection. If this
Third Boot Device	CDROM	function is enabled
Boot Other Device	Enabled	and someone
Swap Floppy Drive	Disabled	attempt to write data
Boot Up Floppy Seek	Disabled	into this area, BIOS
Boot Up Numlock Status	On	will show a warning
Gate A20 Option	Fast	message on screen
Typematic Rate Setting	Disabled	and alarm beep
Typematic Rate (chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
MPS Version Control for OS	1.4	
OS Select For DRAM>64MB	Non-OS2	
Video BIOS Shadow	Enabled	
Small Logo (EPA) Show	: Enabled	

Virus Warning

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

CPU Internal Cache / External Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are *Enabled*.

CPU L2 Cache ECC Checking

This field enables or disables the ECC (Error Correction Checking) checking of the CPU level-2 cache. The default setting is *Enabled*.

Processor Number Feature

When enabled, this feature allows external systems to detect the processor number/type of the CPU.

Quick Power On Self Test

When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

First/Second/Third Boot Device

These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS/ZIP*, *HDD-0*, *SCSI*, *CDROM*, *HDD-1*, *HDD-2*, *HDD-3*, *LAN* and *Disable*.

Boot Other Device

These fields allow the system to search for an operating system from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive

This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to *Disabled.*

Boot Up Floppy Seek

When enabled, the BIOS will seek whether or not the floppy drive installed has 40 or 80 tracks. 360K type has 40 tracks while 760K, 1.2M and 1.44M all have 80 tracks.

Boot Up NumLock Status

This allows you to activate the NumLock function after you power up the system.

Gate A20 Option

This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)
When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

Typematic Delay (Msec)
When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option
This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

OS Select for DRAM > 64MB
This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

Video BIOS Shadow
This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

Small Logo (EPA) Show
This field enables the showing of the EPA logo located at the upper right of the screen during boot up.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

DRAM Clock / Drive Control	Press Enter	ITEM HELP
AGP & P2P Bridge Control	Press Enter	Menu Level
CPU & PCI Bus Control	Press Enter	
Memory Hole	Disabled	
System BIOS Cacheable	Disabled	
Video RAM Cacheable	Disabled	
VGA Share Memory Size	16M	
Select Display Device	CRT_LCD	
Panel Type	02	

DRAM Clock / Drive Control

This field provides settings related to DRAM. The fields and their respective default settings include DRAM Clock (By SPD), DRAM Timing (By SPD), DRAM CAS Latency (2.5), Bank Interleave (Disabled), Precharge to Active (3T), Active to Precharge (6T), Active to CMD (3T) and DRAM Command Rate.

DRAM Clock
The default setting of the DRAM clock is SPD.
DRAM Timing
This option refers to the method by which the DRAM timing is selected. The default is By SPD.
DRAM CAS Latency
This is the period between when the chipset requests data from memory and when the memory is ready to send the data across the bus.
Bank Interleave
This decides how multiple memory modules communicate. It will only make a difference if you have more than one memory module.
Precharge to Active
The amount of time from a bank precharge request to when it can be activated.
Active to Precharge
The Active to Precharge timing controls the length of the delay between the activation and precharge commands – the length of time after activation can the access cycle be started again.
Active to CMD
This is the time between a row access request and a column access request.
DRAM Command Rate
This is the time to wait after a chip select before activate and read can be started.

AGP & P2P Bridge Control

The fields related to AGP & P2P Bridge Control and their respective default settings include AGP Aperture Size (64M), AGP Mode (2X), AGP Driving Control (Auto), AGP Driving Value (DA), AGP Fast Write (Disabled), AGP Master 1 WS Write (Disabled) and AGP Master 1 WS Read (Disabled).

AGP Aperture Size
The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The default setting is 64M.

AGP Mode
This option sets the AGP Mode.

AGP Driving Control
This is the period between when the chipset requests data from memory and when the memory is ready to send the data across the bus.

AGP Driving Value
This decides how multiple memory modules communicate. It will only make a difference if you have more than one memory module.

AGP Fast Write
This accelerates memory write transactions from the chipset to the AGP device.

AGP Master 1 WS Write
When enabled, this changes the default from a 2ws to a 1ws which will increase AGP Writing.

AGP Master 1 WS Read
By default, the AGP busmastering device waits for at least 2 wait states before it starts a write transaction. When enable, this option sets the delay to 1 wait state.

CPU & PCI Bus Control

The fields related to CPU & PCI Bus Control and their respective default settings include CPU to PCI Write Buffer (Enabled), PCI Master 0 WS Write (Enabled) and PCI Delay Transaction (Disabled).

CPU to PCI Write Buffer
This controls the CPU write buffer to the PCI bus.

PCI Master 0 WS Write
This determines whether the chipset inserts a delay before any writes from the PCI bus.

PCI Delay Transaction
This is used to meet the latency of PCI cycles to and from the ISA bus.

Memory Hole

In order to improve performance, certain space in memory can be reserved for ISA cards. By default, this field is disabled.

System BIOS Cacheable

The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video RAM Cacheable

The field allows the copying RAM of the video controller into RAM for faster access. By default, this field is disabled.

VGA Share Memory Size

The field sets memory size that can be shared as VGA memory. The default setting is *16M*.

Select Display Device

The field selects the display device or devices that the system users. The default setting is CRT+LCD.

Panel Type

This field sets the panel type that is supported by the system. Below are the selections for the different panel types:

Panel ID	Resolution	Channel	Dithering
0	640x480	1	Enable
1	800x600	1	Enable
2	1024x768	1	Enable
3	1280x768	1	Enable
4	1280x1024	2	Enable
5	1400x1050	2	Enable
6	1600x1200	2	Enable
7	1280x800	1	Enable
8	800x480	1	Enable
9	1024x768	2	Enable
A	1024x768	1	Disable
B	1024x768	2	Disable
C	1280x768	1	Disable
D	1280x1024	2	Disable
E	1400x1050	2	Disable
F	1600x1200	2	Disable

Note: Dithering Enable is for 18 bits panel and Disable is for 24 bits panel.

Integrated Peripherals

This section configures IDE and PCI devices and other peripherals.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

		ITEM HELP
VIA OnChip IDE Device	Press Enter	Menu Level
VIA OnChip PCI Device	Press Enter	
SuperIO Device	Press Enter	
Init Display First	PCI Slot	

Phoenix - AwardBIOS CMOS Setup Utility
VIA OnChip IDE Device

		ITEM HELP
On-Chip IDE Channel 0	Enabled	Menu Level
On-Chip IDE Channel 1	Enabled	
IDE Prefetch Mode	Enabled	
Primary Master PIO	Auto	
Primary Slave PIO	Auto	
Secondary Master PIO	Auto	
Secondary Slave PIO	Auto	
Primary Master UDMA	Auto	
Primary Slave UDMA	Auto	
Secondary Master UDMA	Auto	
Secondary Slave UDMA	Auto	
IDE HDD Block Mode	Enabled	

Phoenix - AwardBIOS CMOS Setup Utility
VIA OnChip PCI Device

		ITEM HELP
OnChip UsB Controller	All Enabled	Menu Level
OnChip EHCI Controller	Enabled	
USB Device Function	Disabled	
USB Keyboard Support	Disabled	
USB Mouse Support	Disabled	

Phoenix - AwardBIOS CMOS Setup Utility
SuperIO Device

		ITEM HELP
Onboard FDD Controller	Enabled	Menu Level
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
RxD, TxD Active	Hi, Lo	
IR Transmission Delay	Enabled	
UR2 Duplex Mode	Half	
Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Onboard Parallel Mode	SPP	
EPOP Mode Select	EPP1.7	
ECP Mode Use DMA	3	
Onboard Serial Port 3	3E8	
Serial Port 3 Use IRQ	IRQ11	
Onboard Serial Port 4	2E8	
Serial Port 4 Use IRQ	IRQ11	
Onboard Serial Port 5	3E0	
Serial Port 5 Use IRQ	IRQ11	
Onboard Serial Port 6	2E0	
Serial Port 6 Use IRQ	IRQ11	

OnChip IDE Channel 0 / 1
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

IDE Prefetch Mode
These field enables/disables the prefetch buffers in the PCI IDE controller. The prefetch buffers are used as a temporary storage place as data is transferred from one location to another.

IDE Primary/Secondary Master/Slave PIO
These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly. The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA
These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

OnChip USB Controller
By default, the USB controller is enabled for all devices. However, the USB devices, keyboard and USB mouse support options must be enabled separately for them to function.

OnChip EHCI Controller
By default, the EHCI (Enhanced Host Controller Interface) Controller is enabled.

IDE HDD Block Mode
This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

Onboard FDD Controller
Select *Enabled* if your system has a floppy disk controller installed on the board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port
These fields allow you to select the onboard serial and parallel ports and their addresses.

UART 2 Mode
UART Mode Select enables you to select the in-frared communication protocol.

Parallel Port Mode
This field allows you to determine parallel port mode function.

SPP	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port

Init Display First
This field allows the system to initialize first the VGA card on chip or the display on the PCI Slot. By default, the *PCI Slot* VGA is initialized first.

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively.

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

		ITEM HELP
ACPI Function	Enabled	
ACPI Suspend Type	S1 (POS)	Menu Level
Power Management	User Define	
HDD Power Down	Disabled	
Suspend Mode	Disabled	
Video Off Option	Suspend -> Off	
Video Off Method	V/H Sync + Blank	
Modem Use IRQ	3	
Soft-Off by PWRBTN	Instant-Off	
Ac Loss Auto Restart	Off	
IRQ/Event Activity	Press Enter	

Phoenix - AwardBIOS CMOS Setup Utility
IRQ/Event Activity Detect

		ITEM HELP
VGA	OFF	
LPT & COM	LPT / COM	Menu Level
HDD & FDD	ON	
PCI Master	OFF	
Modem Ring Resume	Disabled	
RTC Alarm Resume	Disabled	
IRQs Activity Monitoring	**Press Enter**	

Phoenix - AwardBIOS CMOS Setup Utility
IRQs Activity Monitoring

		ITEM HELP
Primary INTR	ON	
IRQ3 (COM2)	Enabled	Menu Level
IRQ4 (COM1)	Enabled	
IRQ5 (LPT 2)	Enabled	
IRQ6 (Floppy Disk)	Enabled	
IRQ7 (LPT 1)	Enabled	
IRQ8 (RTC Alarm)	Disabled	
IRQ9 (IRQ2 Redir)	Disabled	
IRQ10 (Rserved)	Disabled	
IRQ11 (Reserved)	Disabled	
IRQ12 (PS/2 Mouse)	Enabled	
IRQ13 (Coprocessor)	Enabled	
IRQ14 (Hard Disk)	Enabled	
IRQ15 (Reserved)	Disabled	

ACPI Function
By default, the ACPI function is enabled.

ACPI Suspend Type
By default, the ACPI Suspend Type is set to S1(POS).

Power Management
This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	Each of the ranges is from 1 min. to 1hr.
(Default)	Except for HDD Power Down which ranges from 1 min. to 15 min.

Under this option, you can also configure other features such HDD Power Down, Doze Mode and Suspend Mode.

HDD Power Down
After the selected period of drive inactivity, the hard disk drive powers down while all other devices remain active. Control of this mode is independent of the Power Management mode selected previously.

Suspend Mode
This option decides when to shutdown video for power saving. You can select it as always on or turn off video when system enters suspend mode.

Video Off Option
This option decides when to shutdown video for power saving. You can select it as always on or turn off video when system enters suspend mode.

Video Off Method
This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows the BIOS to control the video display card if it supports the DPMS feature.
Blank Screen	This option only writes blanks to the video buffer.

Modem Use IRQ

This field sets the IRQ used by the Modem. By default, the setting is *3*.

Soft-Off by PWRBTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds. The default value is *Instant Off*.

AC Loss Auto Restart

This field sets the auto restarting function of the system when there is AC power loss.

IRQ/Event Activity Detect

The items under this field are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

PNP OS Install	No	ITEM HELP
Reset Configuration Data	Disabled	Menu Level
Resources Controlled By	Auto	Default is Disabled.
IRQ Resources	Press Enter	Select Enabled to reset Extended System Configuration Data
		(ESCD) when you exit
PCI/VGA Palette Snoop	Disabled	Setup if you have
Assign IRQ for VGA	Enabled	installed a new add-on
Assign IRQ for USB	Enabled	and the system reconfiguration has caused such a serious conflict that the OS cannot boot

PNP OS Install

Enable the PNP OS Install option if it is supported by the operating system installed. The default value is *No*.

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is *Disabled.*

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices automatically with the use of a use a PnP operating system such as Windows 95.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

Assign IRQ for VGA/USB

By default, this fields are Enabled.

PC Health Status

This section shows the parameters in determining the PC Health Status.
These parameters include temperatures, fan speeds and voltages.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

		ITEM HELP
CPU Warning Temperature	Disabled	
Current System Temp.		
Current CPU Temp		
Current System Fan Speed		
Current CPU Fan Speed		
Vcore (V)		
Vcc3		
++5V		
+12V		
-12V		
VBAT (V)		
++5VSB (V)		
Shutdown Temperature	Disabled	

CPU Warning Temperature

This field sets the temperature threshold that when it is reached, the
system would give an audible warning.

Temperatures/Fan Speeds/Voltages

These fields are the parameters of the hardware monitoring function
feature of the board. The values are read-only values as monitored by the
system and show the PC health status.

Shutdown Temperature

This field sets the temperature threshold that, when it is reached, the
system shuts down automatically.

Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

		ITEM HELP
VIA C3 Clock Ratio	Default	
Auto Detect DIMM/PCI Clk	Disabled	Menu Level
Spread Spectrum	Disabled	

VIA C3 Clock Ratio

This field sets the clock ratio of the C3 processor. The default setting is *Default*. This means that the clock ratio uses the clock ratio that is default with the processor.

Auto Detect DIMM/PCI Clk

This field enables or disables the auto detection of the DIMM/PCI clock. The default setting is *Disabled*.

Spread Spectrum

This field sets the value of the spread spectrum. The default setting is *Disabled*. This field is for CE testing use only.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Setup Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Set Supervisor/User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.

Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses, which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Serial Port 3
IRQ11	Serial Port 4
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

C. Panel Type Selection

The table below shows the different panel ID and corresponding resolution, number of channels and dithering feature.

Panel ID	Resolution	Channel	Dithering
0	640x480	1	Enable
1	800x600	1	Enable
2	1024x768	1	Enable
3	1280x768	1	Enable
4	1280x1024	2	Enable
5	1400x1050	2	Enable
6	1600x1200	2	Enable
7	1280x800	1	Enable
8	800x480	1	Enable
9	1024x768	2	Enable
A	1024x768	1	Disable
B	1024x768	2	Disable
C	1280x768	1	Disable
D	1280x1024	2	Disable
E	1400x1050	2	Disable
F	1600x1200	2	Disable

Note: Dithering Enable is for 18 bits panel and Disable is for 24 bits panel.

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